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ABSTRACT

The absenteeism of 252 mainstreamed learning disabled (LD) elementary and high school students was examined over 4 consecutive years for elementary Ss and 3 1/2 years for secondary Ss. Orthogonal polynomial analysis was used to find the relationship between absenteeism and time as measured in school semesters. In general, analyses indicated the following findings: the absenteeism of secondary LD Ss generally increased across semesters, although the rate was less for Ss dismissed from Plan A (resource room program) than for those still in Plan A; the absenteeism of low-absentee elementary LD Ss showed only a small increase across semesters, and absenteeism was virtually independent of enrollment status in Plan A; and the absenteeism of high-absentee elementary LD Ss still in Plan A increased across semesters, but the absenteeism of high-absentee elementary students dismissed from Plan A decreased after the introduction of Plan A. Differences between projected average percent absent and actual percent absent showed that dismissed high-absentee elementary Ss attended more school after Plan A than would have been expected. (CL)

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The Longitudinal Effect of Resource Room Intervention on School Absenteeism of Learning Disabled Students

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by

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The Longitudinal Effect of Resource Room
Intervention on School Absenteeism
of Learning Disabled Students

The study investigated absenteeism of learning disabled (LD) students served in a mainstream, individualized program for handicapped children. The mainstreaming movement received support from leading authorities including Deno (1970), Reger (1973), Sabatino (1972), and Wiederholt (1974), and public school adoption of resource rooms in special education programs has generally been rapid. The least restrictive environment mandate of Public Law 94-142 has given further impetus to the mainstreaming movement, and one can expect increased adoption and refinement of resource room models in order to provide at least partial regular classroom experience for special education students.

The limited research results emerging from resource room studies have been generally encouraging (Glavin, 1973; Macy and Carter, 1978; Macy and Enox, 1974; Sabatino, 1971; Walker, 1974), but the lack of research prompted Gickling and Theobald (1975) to question whether or not the philosophical commitment to mainstreaming had not outraced its research support. A review of literature today reinforces this motion as there is still only meager empirical support for the effectiveness of mainstreaming and associated resource room models.

One notable exception to the above has been Plan A implementation in the Dallas Independent School District, Dallas, Texas. The Texas Legislature created the Comprehensive Special Education Program, or better known as Plan A, in the late sixties to improve state-wide delivery of educational services to the handicapped. The Plan A model sought to provide a continuum

of instructional arrangements, and one of the predominant features of Plan A was the use of resource rooms for delivery of special service on a part-time basis. Hence, several of the early reported mainstream projects were located in Texas (Birch, 1974).

The Dallas Independent School District (DISD) management opted to implement Plan A on a pilot basis in one high school cluster before expanding to the remaining 18 high school clusters. State guidelines provided sufficient lead time for pilot implementation, and state funding also encouraged allocation of Plan A resources for program research and evaluation. A rapidly developing research and evaluation department in the DISD at the time of Plan A initiation provided a needed resource, and Dr. Ruth M. Turner, special education director, was instrumental in securing research and evaluation resources for Plan A.

Studies conducted in Plan A during the three-year pilot implementation in the DISD yielded a significant body of knowledge about mainstream, individualized programming for the handicapped and about the evaluation of such programs. Evaluation procedures developed included a computer-based process monitoring system (Macy, 1974a), principles for implementing the CIPP model in developing programs (Macy, 1975b), and delineation of evaluation questions and procedures for pilot implementation (Macy, 1975a). Turner and Macy (1978) reported results of implementing individualized educational programs in Plan A, and Macy (1974b) and Macy and Carter (1975) found improved academic performance among LD students in Plan A. Macy and Carter (1978) showed that the potential extent of mainstreaming for typically self-contained students (EMR, TMR, MBI, and ED) was considerable. Macy and Enox (1974) reported positive effects of resource room intervention on absen-

teeism and class cutting, and this report addresses longitudinal effects on absenteeism of LD students.

Much of the research involving school absenteeism has centered about investigating relationships between absenteeism and academic achievement. In spite of intuition which suggests that there should be a relationship between absenteeism and achievement, reports in the literature are conflicting. Hersov (1960) and Tyerman (1958) both reported significant relationships between school grades and attendance, while Finch and Nemzeck (1940) and Caro (1962) found negligible relationships. However, there does seem to be agreement that school absenteeism is associated with high risk students and with delinquency (Stringer, 1973; Tennent, 1971).

Many of the dropout projects conducted by school districts have attempted to prevent dropout by increasing school attendance through the use of modified secondary school programs. Such modifications have typically included an increase in elective courses, in parent-school contacts, in job placement services, in work study programs and so forth. Although there are relatively few reports on the effectiveness of these projects, reported studies have found some to be effective and others not effective (St. Louis Board of Education, 1971).

While absenteeism is a critical variable, and while dropout projects have concentrated on reducing the absenteeism of potential dropouts at the secondary school level, there has been little reported research pertaining to the reduction of absenteeism of elementary students or students with learning disabilities and related problems. One could easily hypothesize that a certain proportion of LD students make up the potential dropout population, since lack of interest and dissatisfaction with school

are two of the major reasons given for dropping out of school (St. Louis Board of Education, (1971). Consequently, one might expect the resource room model to affect school absenteeism positively.

A review of literature revealed only three rpeorted studies which have investigated the effect of part-time resources room attendance on school absenteeism of students. Glavin, Quay, Annesley, and Werry (1973) found that problem behavior students made significantly better math achievement in a part-time resource room but did not find any effect on school absenteeism. Teeter (1973) reported that a part-time resource room reduced absenteeism of third grade learning disabled students but did not affect absenteeism of kindergarten and sixth grade students. Macy and Enox (1974) found that the resource room was effective in reducing absenteeism of high-absentee elementary school LD students but not that of high school students, but the resource room was effective in reducing the incidence of class cutting among high school LD students.

Methodology

There was considerable variability in Plan A implementation across Texas school districts. The Dallas pilot Plan A model provided a continuum of instructional arrangements ranging from total integration in the regular classroom to complete self-contained instruction in a special service agency setting. The program stressed individualized instruction for each child, with mainstreaming into the regular classroom whenever feasible. The vast majority of Plan A students received special services through part-time attendance (usually 1-3 hours) in a resource room.

The basic instructional model was the individualized educational plan which outlined instructional objectives, activities, materials, and timelines for completion. The educational plans were developed through a multidisciplinary team effort which included the school principal, the child's regular teacher, the special education teacher, school psychologist, visiting teacher, educational diagnostician, speech clinician, and school nurse.

Most Plan A resource rooms had two resource teachers, and thus, many children were able to receive 5-10 minutes of one-to-one instruction during a given class period. Upon arrival in the resource room each day, children picked up their individual lesson goals and activities for that day and began working at one of several work stations and learning centers set up in the resource room. Plan A resource rooms were essentially like the exemplary resource room described by D'Alonzo, D'Alonzo, and Mauser (1979). There were usually 10-25 children in a resource room at any given time, and resource teachers provided instruction to small groups of children when they had common objectives and learning activities.

Sample

Students were selected from the population of students (N=927) who entered Plan A during the 1972-73 school year (the first year of Plan A implementation). The pilot Plan A cluster included one high school, one junior high, and eight elementary schools. Students who enrolled in Plan A by reason of learning disabilities were required to meet state eligibility criteria which precluded special education assignment on the basis of English language competence and which included vision and hearing examinations and evidence of sensory deficits. Guidelines also included discrepant achievement as evidence for LD eligibility. The collection of longitudinal

attendance data necessarily restricted the size of the sample to be drawn from the population. The sample included any LD student who met all of the following conditions:

1. entered the District during 1970-71 or before. This allowed for the collection of baseline data prior to the students' entrance into the Plan A program.

2. entered Plan A during the first year of program implementation (1972-73).

3. whose school experience during the total observation period was entirely elementary or entirely secondary. This was an attempt to avoid a confounding of the results by a transfer from elementary to secondary school attendance.

The preceding conditions identified a sample of 252 students, or about 32 percent of the initial LD population. The sample included 179 elementary LD students and 73 secondary LD students.

Most of the eight elementary schools contributed about 13 percent of the total sample of elementary LD students. One school contributed 26 percent, and two schools yielded four percent each. Gender and ethnicity representations reflected population proportions which were 74 percent male, 49 percent White, 34 percent Black, and 17 percent Hispanic. Most students were in the fifth or sixth grade during the final year of observation.

Both the high school and junior high contributed about one-half the sample of secondary LD students. The sample was about 68 percent male, 47 percent White, 41 percent Black, and 12 percent Hispanic. Most students were in the eleventh or twelfth grade during the final semester of

observation.

The total sample of 252 LD students was divided into six subsamples according to school level (elementary or secondary), extent of absenteeism before Plan A (high or low-absentee), and Plan A enrollment status (still in Plan A or dismissed). Dismissed students were those who discontinued resource room contact (almost always by decision of special education placement committee) and who returned on a full-time basis to the regular classroom. These students had showed progress, and one might expect different school absenteeism patterns for "successful" students. A high-absentee student was any who missed nine or more days in the first five of the six reporting periods during the 1971-72 year (about five percent of the total school year). The sixth reporting period was deleted in determining extent of absenteeism before Plan A in order to avoid any absenteeism patterns associated with the end of a school year.

The sizes for the sample subgroups were:

School level	Extent of absenteeism	Plan A enrollment	N
elementary	low	active	44
		dismissed	57
	high	active	42
		dismissed	36
secondary	(no division)	active	28
		dismissed	45
		Total	252

Analysis

The study considered records of student attendance for each semester over four consecutive years for elementary school students and three and one-half years for secondary students. The years considered for elementary students were: 1970-71, 1971-72, 1972-73, and 1973-74. The year 1972-73 was the initial year of Plan A implementation, so there were four semesters before Plan A and four semesters after the introduction of Plan A.

The years considered for secondary students were 1971-72, 1972-73, 1973-74, and 1974 (fall semester only). Consequently, there were only two semesters of pre-Plan A experience and five semesters of post-Plan A experience for secondary students. It was necessary to collect attendance data in this way in order to have a sufficiently large sample of secondary students.

Recall that during the above series of observed semesters, elementary students attended only elementary school, and secondary students attended only a secondary school. The dependent variable was the percent of each semester the student was absent from school. Percent absent was computed as the number of days absent (to the nearest one-half day) divided by the total number of school days in the semester. The rationale behind the analysis of attendance data is rather straight-forward and makes only two simple assumptions. The first assumption is that without Plan A, we would expect a linear trend in absenteeism across consecutive semesters. Furthermore, this trend would probably be upward, thereby reflecting increased absenteeism as students grew older. The second assumption is that the intervention of Plan A would reverse the upward trend. After Plan A absenteeism would either hold constant or decline. If the above two assumptions were true, orthogonal polynomial analysis would yield a curvi-

linear equation rather than a linear equation as the best fit for a set of attendance data. Figure 1 provides a graphic presentation of the expected changes in absenteeism, if in fact, a reduction in absenteeism occurs after the introduction of Plan A.

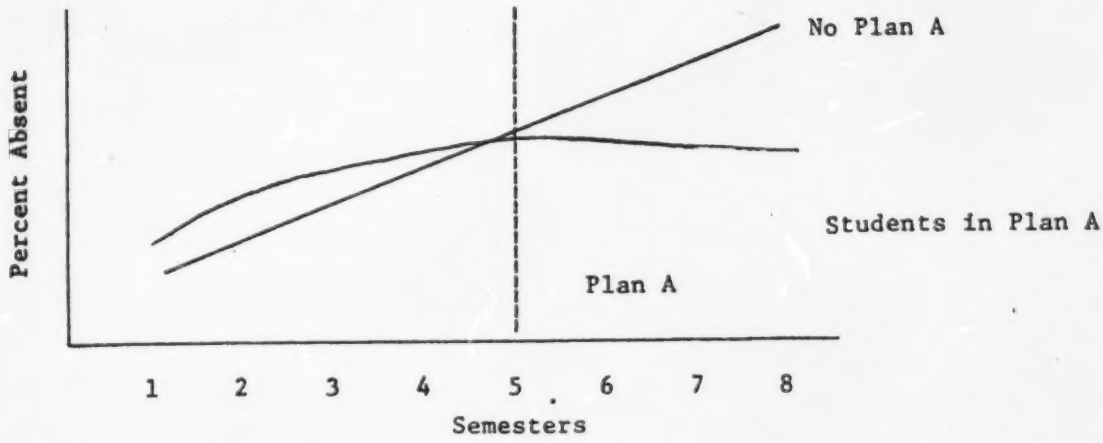

Figure 1

Expected Changes in Average Absenteeism Given that Plan A Results in Reduced Absenteeism

The method of orthogonal polynomial analysis is one means of separating the variation in data into linear and curvilinear components in order to study the form of the relationship existing between two variables. In the case of attendance data, the question of interest was the form of the relationship between absenteeism and time, measured in school semesters.

The first step in computing orthogonal polynomials was the computation of a simple repeated-measures ANOVA in order to isolate the variation (i.e.,

sums of squares) due to school semesters. A non-significant F-test for school semesters indicated that there was no relationship between absenteeism and semesters. If a significant effect due to semesters is present, a series of weighted orthogonal (i.e., independent) comparisons may be computed to partition the variation due to semesters, into linear, quadratic, cubic, and other higher-order components. F-tests can then be made to determine the significance (or increased fit of the polynomial to the data) of each orthogonal component. The interested reader might consult Winer (1971, pp. 177-185) for a fairly thorough exposition of the procedure.

In order to obtain a complete analysis, a computer program, POLY (Cooley and Lohnes, 1971, pp. 76-94), was used to generate the actual polynomial equations that provided the best fit to the observed attendance data. The fitted equations were useful in determining the rates of change in absenteeism across semesters. In the case of a linear polynomial, the beta weight (i.e., coefficient of the independent variable, semesters) was the slope of the fitted line, since a fitted linear polynomial is merely a slope-intercept expression of an equation for a straight line.

Fitted polynomials generated by Poly were of the following general form:

$$\hat{Y} = b_1 X_i + b_2 X_i^2 + \ldots b_k X_i^k + c,$$

where $\hat{Y}$ = a predicted dependent variable, percent absent

b = a beta weight

X = an independent variable, semesters

c = constant.

The following reports the results of analyses for each sample group. The reader should generally look for the repeated-measures ANOVA summary, the results of the partition of semester variation into orthogonal components, and the actual polynomial equation.

Results

In general, the analyses revealed the following findings:

1. The absenteeism of secondary LD students generally increased across semesters, but the rate of increase was less for students who were dismissed from Plan A than for those still in Plan A.
2. The absenteeism of low-absentee elementary LD students showed only a small increase across semesters, and absenteeism was virtually independent of enrollment status relative to Plan A.
3. The absenteeism of high-absentee elementary LD students still in Plan A increased across semesters, but the absenteeism of high-absentee elementary students dismissed from Plan A decreased after the introduction of Plan A.

The above three findings summarize the results of attendance data analyses. The following presents detailed results in support of each finding.

Secondary school students. Table 1 presents the average percent of each semester for which secondary students still in Plan A and dismissed from Plan A were absent. Figure 2 graphically presents selected information from Table 1.

Table 1

Average Number of Days and Percent of Each Semester for Which Secondary LD Students Were Absent

		Semester						
		1971 Fall	1972 Spring	1972 Fall	1973 Spring	1973 Fall	1974 Spring	1974 Fall
Total School Days		88	92	94	86	91	89	85
Plan A (N=28)	Days absent	5.1	7.3	8.1	9.3	10.4	16.2	19.2
	Percent absent	5.81	7.94	8.65	10.79	11.40	18.19	22.57
Dismissed (N=45)	Days absent	7.9	9.4	10.7	10.5	13.4	17.3	15.4
	Percent absent	8.98	10.26	11.41	12.17	14.68	19.41	18.17

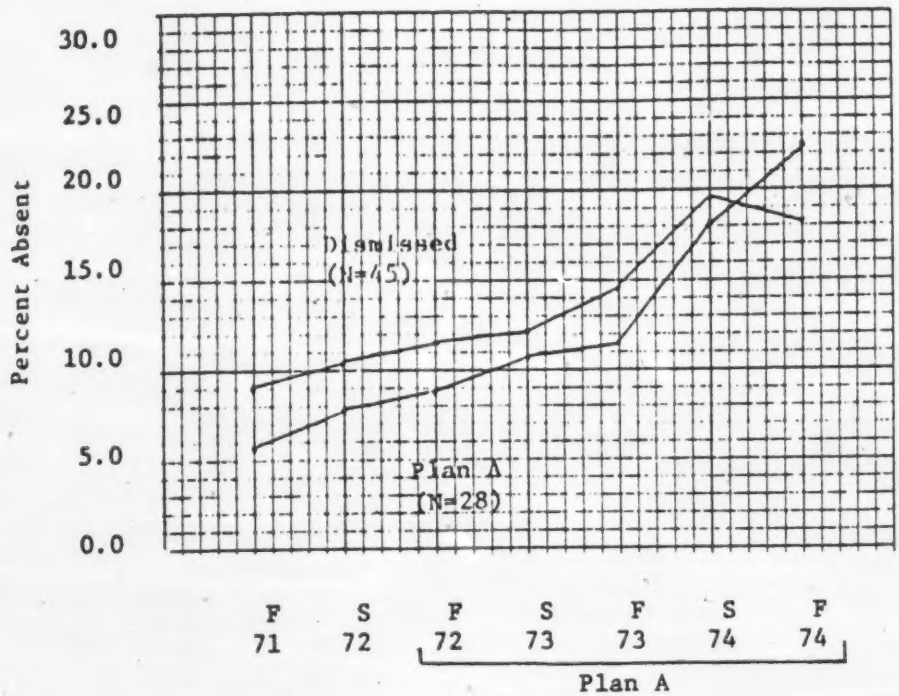

Figure 2

Changes in Average Absenteeism of Secondary LD Students

The following gives the results of the orthogonal polynomial analysis for secondary LD students:

ANOVA Summary:

		Plan A (N=28)			Dismissed (N=45)	
Source	df	MS	F	df	MS	F
Students	27	.0305		44	.0703	
Semesters	6	.1009	16.37	6	.0713	9.64
Residual	162	.0062		264	.0074	

Partition of Variation:

Source	df	MS	F	df	MS	F
Semesters	6	.1009		6	.0713	
Linear	1	.5375	87.21	1	.3881	52.45
Quadratic	1	.0481	7.81	1	.0041	.55
Cubic	1	.0073	1.18	1	.0078	1.05
Other	3	.0041	.67	3	.0094	1.26

Polynomial

$\hat{Y}_i = .026X_i + .017$ | $\hat{Y}_i = .018X_i + .066$

Inspection of Figure 2 clearly indicates that secondary students increased absenteeism during the three and one-half years represented in the attendance data. It is important to note that the rate of increase in absenteeism for dismissed students was only 69 percent of the rate of increase for students still in Plan A. The value of 69 percent was obtained by dividing the beta weight (slope or rate of increase) from the polynomial for dismissed students by the beta weight from the polynomial for the students still in Plan A. Hence,

$.018 \div .26 = .6923$ or 69.23 percent.

In other words, students who were dismissed from Plan A did not miss as much school as those who were still in Plan A, even though both groups increasingly missed more school as time passed. (Note that dismissed students were those who returned to the regular class on a full-time basis and not those who moved or dropped out of school.)

The observed difference in rates of increase in absenteeism raises an interesting question since most or all of the students dismissed from Plan A experienced some degree of academic success, at least as observed by the Plan A teacher. The reader should note that in the absence of a control comparison and in the absence of nonrandom assignment of students to treatment groups, it is impossible to say whether Plan A success decreased absenteeism or whether the decreased absenteeism caused Plan A success.

Low-absentee elementary school students. Attendance data from low-absentee elementary students showed only a small increase in absenteeism across the four-year period. Table 3 contains the average percent of each semester for which low-absentee elementary students were absent, and Figure 3 is a graphic presentation of data in Table 3.

Table 3

Average Number of Days Absent and Percent Absent for each Semester for Low-Absentee Elementary LD Students

		Semester							
		1970 Fall	1971 Spring	1971 Fall	1972 Spring	1972 Fall	1973 Spring	1973 Fall	1974 Spring
Total School Days		90	90	88	92	94	86	91	89
Plan A (N=44)	Days absent	2.7	3.7	2.5	3.2	4.0	4.5	4.6	5.1
	Percent absent	3.04	4.14	2.82	3.50	4.21	5.22	5.00	5.75
Dismissed (N=57)	Days absent	2.4	3.2	1.9	2.5	4.2	4.3	3.4	5.0
	Percent absent	2.72	3.51	2.17	2.71	4.44	4.95	3.76	5.65

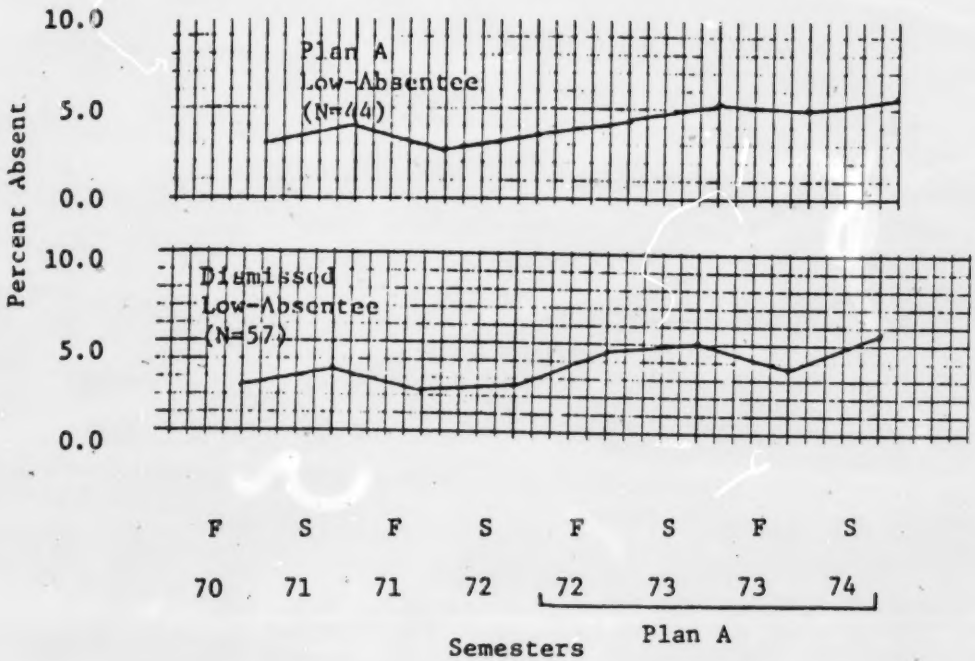

Figure 3

Changes in Average Absenteeism of Low-Absentee Elementary LD Students

The following gives the results of the orthogonal polynomial analysis for low-absentee elementary students:

ANOVA Summary:

Source	Plan A (N=44) df	MS	F	Dismissed (N=57) df	MS	F
Students	43	.0059		56	.0033	
Semesters	7	.0049	3.77	7	.0083	8.30
Residual	301	.0013		392	.0010	

Partition of Variation :

Source	df	MS	F	df	MS	F
Semesters	7	.0049		7	.0083	
Linear	1	.0253	19.4t	1	.0343	34.30
Quadratic	1	.0017	1.31	1	.0026	2.60
Cubic	1	.0003	0.23	1	.0006	.60
Other	4	.0017	1.31	4	.0052	5.20

Polynomial:

$\hat{Y}_i = .004X_i + .025$ | $\hat{Y}_i = .004X_i + .020$

The rates of increase in absenteeism were virtually the same for both dismissed students and those still in Plan A. Comparison of beta weights from the two polynomials makes this evident, since both polynomials had the same beta weight of .004. In fact, the fitted linear equations were almost identical.

High-absentee elementary school students. Analysis of attendance data of high-absentee elementary LD students showed a linear upward trend in absenteeism of students who were still in Plan A. However, the trend in absenteeism of dismissed students was curvilinear in that there was an up-

ward trend before Plan A but a downward trend after Plan A. Table 4 gives the average percent of each semester absent for high-absentee elementary LD students, and Figure 4 shows a graphic representation of changes in absenteeism of these students.

Table 4

Average Number of Days Absent and Percent Absent for Each Semester for High-absentee Elementary LD Students

		Semester							
		1970 Fall	1971 Spring	1971 Fall	1972 Spring	1972 Fall	1973 Spring	1973 Fall	1974 Spring
Total School Days		90	90	88	92	94	86	91	89
Plan A (N=42)	Days absent	8.7	11.1	10.8	13.3	10.8	12.6	13.0	13.8
	Percent absent	9.66	12.38	12.28	14.45	11.49	14.69	14.31	15.52
Dismissed (N=36)	Days absent	6.1	7.0	8.5	12.3	7.8	8.2	6.8	8.5
	Percent absent	6.79	7.75	9.71	13.33	8.26	9.58	7.51	9.58

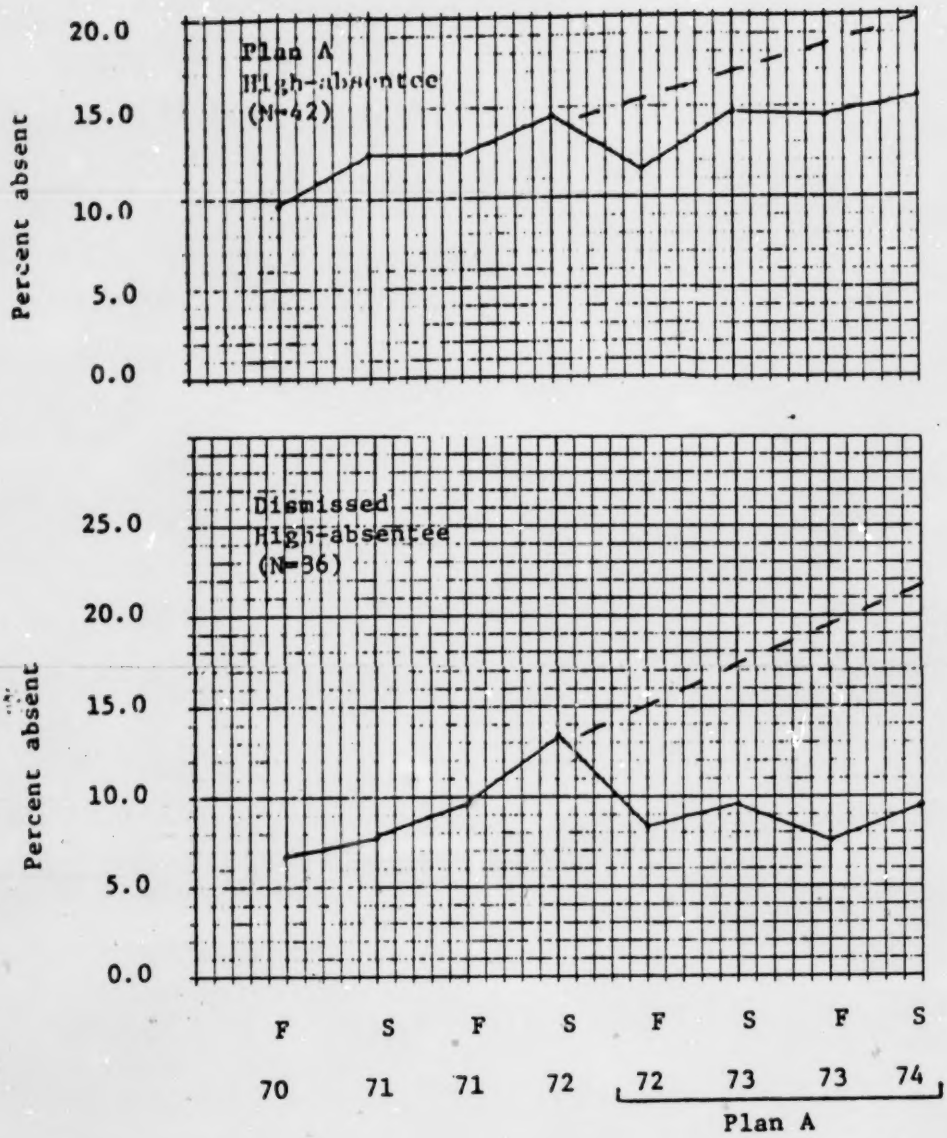

Figure 4

Changes in Average Absenteeism of High-absentee Elementary LD Students

The following gives the results of the orthogonal polynomial analysis for high-absentee elementary students.

ANOVA Summary:

	Plan A (N=42)			Dismissed (N=36)		
Source	df	MS	F	df	MS	F
Students	41	.0583		35	.0182	
Semesters	7	.0164	3.28	7	.0150	5.36
Residual	287	.0050		245	.0020	

Partition of Variation:

Source	df	MS	F	df	MS	F
Semesters	7	.0164		7	.0150	
Linear	1	.0754	15.08	1	.0036	1.29
Quadratic	1	.0015	.30	1	.0277	9.89
Cubic	1	.0087	1.74	1	.0185	6.61
Other	4	.0073	1.45	4	.0138	4.93

Polynomial:

$$\hat{Y}_i = .007X_i + .102$$

$$\hat{Y}_i = .069X_i - .015X_i^2 + .001X_i^3 + .006$$

As is obvious from the above, there was a curvilinear relationship between time and absenteeism for high-absentee LD students dismissed from Plan A, but a linear relationship for those retained in Plan A.

In order to compare observed absenteeism to what would have been expected from attendance data prior to Plan A, linear polynomials were fitted to attendance data from the first four semesters. The dotted lines in Figure 4 represent the projected average percent absent based on trends in the four semesters before Plan. The fitted polynomial for the Plan A group was:

$$\hat{Y}_i = .014X_i + .086$$

and was

$$\hat{Y}_i + .022X_i + .040$$

for the dismissed group. Table 5 presents the projected average percent absent during the four semesters after Plan A.

Table 5

Projected Average Percent Absent for Each Semester for High-absentee Elementary LD Students

		Semester			
		1972 Fall	1973 Spring	1973 Fall	1974 Spring
Plan A (N=42)	Projected	15.60	17.00	18.40	19.80
	Actual	11.49	14.69	14.31	15.52
	Difference	4.11	2.31	4.09	4.28
Dismissed (N=36)	Projected	15.00	17.20	19.40	21.60
	Actual	8.26	9.58	7.51	9.58
	Difference	6.74	7.62	11.89	12.02

The differences between projected average percent absent and actual percent absent (Table 5) clearly show that dismissed high-absentee elementary LD students attended more school after Plan A than would have been expected. In fact, the extent of average absenteeism below the expected level was a little more than two school weeks during the final two semesters (11.89 days in the fall and 12.02 days in the spring). Projections based on attendance prior to Plan A also showed that students still in Plan A attended school somewhat more than would have been expected, but the differences between projected and actual percent absent were not nearly as large as for dismissed students.

Information presented in Figure 4 and in Tables 4 and 5 would seem to indicate that Plan A was effective in reducing absenteeism among high-absentee elementary LD students. Unfortunately, the design of the study did not permit comparisons to a control group, so it was difficult to determine the actual cause of the observed reduction in absenteeism. The longitudinal nature of the data make the results more compelling, but of course one major alternative explanation for the observed patterns could be some historical event other than Plan A intervention.

The researchers were aware of no such historical events that may have affected absenteeism of elementary school students. However, the first year (1971-72) of observation for secondary students was also the first year of court-ordered desegregation in the District. The order did not include elementary schools. The order remained in effect throughout the total observation period, but the possible impact of desegregation on attendance was not known. One should note the implementation of the desegregation order in the District was peaceful and orderly, as contrasted to similar orders in other major cities.

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